NEW COURSE PROPOSAL

PROGRAM AREAS ______ MATH

1. **Catalog Description of the Course.** [Include the course prefix, number, full title, and units. Provide a course narrative including prerequisites and corequisites. If any of the following apply, include in the description: Repeatability (May be repeated to a maximum of ___ units); time distribution (Lecture ___ hours, laboratory ___ hours); non-traditional grading system (Graded CR/NC, ABC/NC). Follow accepted catalog format.]

   **MATH 351 REAL ANALYSIS (3)**
   
   Three hours of lecture per week.
   
   Prerequisite: MATH 250.
   
   Topics include: real number system, metric spaces, norms, function spaces, discontinuity, differentiability, integrability of functions, sequences and series.

2. **Mode of Instruction.**

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<thead>
<tr>
<th>Lecture</th>
<th>Units</th>
<th>Hours per Unit</th>
<th>Benchmark Enrollment</th>
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<td><strong><strong>3</strong></strong></td>
<td><strong><strong>1</strong></strong></td>
<td><strong><strong>24</strong></strong></td>
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<tr>
<td>Seminar</td>
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<td>Laboratory</td>
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<td>Activity</td>
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3. **Justification and Learning Objectives for the Course.** (Indicate whether required or elective, and whether it meets University Writing, and/or Language requirements) [Use as much space as necessary]

   The course is a required course for Mathematics majors.

   Through this course, students will be able to

   - Discuss the theoretical basis of the system of real numbers
   - Work in general metric and function spaces
   - Analyze functions in terms of continuity, differentiability and integrability.
   - Demonstrate application of sequences and series on an advanced level.
   - Express concepts and techniques of Real Analysis in oral and written form.

   This course is not designed to satisfy the University Writing or Language requirements.

4. **Is this a General Education Course**

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<th>YES</th>
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   If Yes, indicate GE category:

   - A (English Language, Communication, Critical Thinking)
   - B (Mathematics & Sciences)
   - C (Fine Arts, Literature, Languages & Cultures)
   - D (Social Perspectives)
   - E (Human Psychological and Physiological Perspectives)

5. **Course Content in Outline Form.** [Be as brief as possible, but use as much space as necessary]
Real number system: Dedekind cuts, supremum/infimum
Metric spaces: Norms, convergence, function spaces.
Continuity: Introduction to general topological spaces, basic theorems on Continuity.
Differentiability: Abstract definition of differentiability, basic properties,
Integrability of functions: Riemann Integrals, Lebesgues Integrals, Criteria of integrability
Sequences and series: Advanced theorems from the theory of sequences and series of numbers, Sequences and series of functions, uniform convergence.

6. References. [Provide 3 - 5 references on which this course is based and/or support it.]

7. List Faculty Qualified to Teach This Course.
All Mathematics faculty

8. Frequency.
a. Projected semesters to be offered: Fall ___X__ Spring _X____ Summer _____

9. New Resources Required.
a. Computer (data processing), audio visual, broadcasting needs, other equipment
   none
b. Library needs
   none
c. Facility/space needs
   none

10. Consultation.
Attach consultation sheet from all program areas, Library, and others (if necessary)

11. If this new course will alter any degree, credential, certificate, or minor in your program, attach a program modification.

___________________________________________________
Proposer of Course    Date